IN THE CLAIMS:

1. (Currently Amended) A mixed conductor comprising ~~wherein~~ an electron conductor made of an inorganic material and ~~is fixed to~~ a proton conductor made of an inorganic material, said electron conductor and said proton conductor being fixed together by at least one of covalent bonding, intercalation and inclusion so as to be insoluble ~~not to dissolve~~ in water.

2. (Currently Amended) A mixed conductor comprising ~~wherein~~ an electron conductor made of an inorganic material obtained by carbonizing an organic material and ~~is fixed to~~ a proton conductor made of an inorganic material, said electron conductor and said proton conductor being fixed together by at least one of covalent bonding, intercalation and inclusion.

3. (Currently Amended) The mixed conductor according to claim 1, wherein said electron conductor is obtained by carbonizing at least one organic compound selected from the ~~a~~ group consisting of aliphatic hydrocarbons, aromatic hydrocarbons and derivatives of ~~the~~ aliphatic hydrocarbons and ~~the~~ aromatic hydrocarbons.

4. (Cancelled)

5. (Currently Amended) The mixed conductor according to claim 1, wherein said electron conductor is ~~made of~~ a carbonaceous material selected from the group

consisting of ~~such as~~ graphite and ~~or a~~ carbon nanotubes.

6. (Currently Amended) The mixed conductor according to claim 1, wherein said proton conductor contains at least one member selected from the ~~a~~ group consisting of ~~a~~ phosphorus-containing compounds, ~~a~~ sulfur-containing compounds, carboxylic acids, ~~boric acid,~~ and inorganic solid-state acids.

7. (Original) The mixed conductor according to claim 1, wherein the electron conductor is fixed to the proton conductor by a covalent bond.

8. (Original) The mixed conductor according to claim 1, wherein the electron conductor is fixed to the proton conductor by intercalation.

9. (Original) The mixed conductor according to claim 1, wherein the electron conductor is fixed to the proton conductor by inclusion.

10. (Original) The mixed conductor according to claim 1, wherein said electron conductor has consecutive carbon-carbon bonds including a carbon-carbon double bond.

11. (Original) The mixed conductor according to claim 1, wherein said electron conductor is obtained by carbonizing an organic compound having one of or both of a carbon-carbon double bond and a carbon-carbon triple bond.

12. (Currently Amended) A method for producing a mixed conductor comprising:

a first step of obtaining a high molecular precursor by polymerizing an organic compound having one of or both of a carbon-carbon double bond and a carbon-carbon triple bond with a proton conducting material; and

a second step of pyrolyzing ~~burning~~ the precursor obtained in the first step in ~~under~~ an inert atmosphere.

13. (Currently Amended) A method for producing a mixed conductor comprising:

a first step of obtaining a high molecular precursor by dispersing a proton conducting material into an organic compound polymer having one ~~of~~ or both of a carbon-carbon double bond and a carbon-carbon triple bond; and

a second step of pyrolyzing ~~burning~~ the precursor obtained in the first step in ~~under~~ an inert atmosphere.

14. (Currently Amended) The mixed conductor producing method according to claim 12, wherein the organic compound having one ~~of~~ or both of the carbon-carbon double bond and the carbon-carbon triple bond is an aliphatic hydrocarbon or an aromatic hydrocarbon.

15. (Currently Amended) The mixed conductor producing method according to claim 14, wherein said organic compound is at least one member selected from the ~~a~~ group consisting of polyacetylene, resorcinol, phenol, phenylphenol, polyaniline, polypyrrole, polythiophene, phenylphosphonic acid, and phenylsilane alkoxide.

16. (Currently Amended) The mixed conductor producing method according to claim 12, wherein said proton conducting material is at least one member selected from the ~~a~~ group consisting of ~~a phosphorus-containing compound,~~ phosphoric acid, ~~ester~~ phosphates, sulfuric acid, ~~ester~~ sulfates, ~~sulfuric acid,~~ tungsten oxide hydroxide, rhenium oxide hydroxide, silicon oxide, tin oxide, zirconia oxide, tungstophosphoric acid, and tungstosilicic acid.

17. (Original) A mixed conductor producing method wherein an organic compound having a π bond is dehydration-condensation polymerized and bound with a compound having movable protons to obtain a precursor having proton conduction, and an energy is applied to said precursor under an inert gas atmosphere to thereby impart electron conduction to the precursor.

18. (Currently Amended) A ~~The~~ mixed conductor comprising an electron conductor made of an inorganic material and a proton conductor made of an inorganic material, said electron conductor and said proton conductor being fixed together to form a catalyst support insoluble in water and ~~according to claim 1, wherein said mixed conductor supports~~ a noble metal catalyst supported on said catalyst support.

19. (Original) The mixed conductor producing method according to claim 12, comprising a third step of causing the precursor burned in said second step to support a noble metal catalyst.

20. (New) A mixed conductor comprising an electron conductor made of an inorganic material obtained by carbonizing an inorganic material and a proton conductor made of an inorganic material, said electron conductor and said proton conductor being fixed together to form a catalyst support insoluble in water and a noble metal catalyst supported on said catalyst support.

21. (New) The mixed conductor according to claim 1 wherein said electron conductor is selected from the group consisting of carbonaceous materials, gold, palladium, platinum, magnesium, lithium, titanium, and alloys thereof; and

the proton conductor is made of at least one member selected from the group consisting of carbonic acid, boric acid, phosphoric acid, phosphoric acid esters, sulfuric acid, sulfuric acid esters, tungsten oxide hydroxide, rhenium oxide hydroxide, silicon oxide, tin oxide, zirconia oxide, tungstophosphoric acid, and tungstosilicic acid.

22. (New) The mixed conductor according to claim 21 wherein said electron conductor is a carbonaceous material.

23. (New) The mixed conductor according to claim 22 wherein said proton conductor is formed of phosphoric acid groups and said carboneaceous material has a graphite structure.

24. (New) The mixed conductor according to claim 2 wherein said proton conductor is at least one member selected from the group consisting of phosphoric acid, phosphates, sulfuric acid, sulfates, tungsten oxide hydroxide, rhenium oxide hydroxide, silicon oxide, tin oxide, zirconia oxide, tunstophosphoric acid, and tungstosilicic acid.

25. (New) The mixed conductor according to claim 24 wherein said electron conductor has a graphite structure.

26. (New) The mixed conductor according to claim 21 wherein said electron conductor is selected from the group consisting of carbonaceous materials, gold, palladium, platinum, magnesium, lithium, titanium, and alloys thereof; and

the proton conductor is made of at least one member selected from the group consisting of carbonic acid, boric acid, phosphoric acid, phosphoric acid esters, sulfuric acid, sulfuric acid esters, tungsten oxide hydroxide, rhenium oxide hydroxide, silicon oxide, tin oxide, zirconia oxide, tungstophosphoric acid, and tungstosilicic acid.

27. (New) The mixed conductor according to claim 26 wherein said electron conductor is a carbonaceous material.

28. (New) The mixed conductor according to claim 27 wherein said proton conductor is formed of phosphoric acid groups and said carboneaceous material has a graphite structure.

29. (New) The mixed conductor according to claim 20 wherein said proton conductor is at least one member selected from the group consisting of phosphoric acid, phosphates, sulfuric acid, sulfates, tungsten oxide hydroxide, rhenium oxide hydroxide, silicon oxide, tin oxide, zirconia oxide, tunstophosphoric acid, and tungstosilicic acid.

30. (New) The mixed conductor according to claim 29 wherein said electron conductor has a graphite structure.